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REMARKS

Reminder regarding change in correspondence address

Applicant notes that the correspondence address for this patent application had previously been changed to the address of customer number 23441, in the change of correspondence address of August 17, 2003. Applicant requests that future office actions and other USPTO correspondence be sent to this address. Any questions regarding this change in correspondence address should be directed to Applicant's representative, Michael Dryja.

Objection to drawings

The drawings have been objected to as not including the reference numbers 301, 302, and 304. Applicant apologizes for this oversight, and submits herewith a substitute drawing sheet for FIG. 3 that includes these reference numbers.

Claim rejections under 35 USC 112

Claim 2 has been rejected under 35 USC 112, second paragraph, as being indefinite. In particular, the phrase "at least one of an error log and a register" has been indicated as rendering claim 2 indefinite. Applicant has amended claim 2 to read "an error log and/or a register," and submits that as amended, claim 2 is now definite.

Claim rejections under 35 USC 102

Claims 1 and 7 as to Yokomizo

Claims 1 and 7 have been rejected under 35 USC 102(b) as being anticipated by Yokomizo (5,768,599). Claims 1 and 7 are independent claims. Applicant has amended claims 1

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and 7 to better clarify their subject inventions, and asserts that Yokomizo does not anticipate the claimed invention.

Applicant believes that the Examiner may not have considered all the limitations of claims 1 and 7 in rejecting claims 1 and 7 over Yokomizo. The claimed invention is directed to an interruption handler storing a recommendation for the operating system to handle an interruption in a storage, and calling the operating system for the operating system to handle the interruption. The interruption handler then examines the storage to determine if the operating system handled the interruption according to the recommendation. Applicant submits that Yokomizo does not anticipate at least these aspects and limitations of the claimed invention.

In particular, the interruption handler 4 of Yokomizo does not store *a recommendation for the operating system 6 to handle the interruption* within the storage 9. (Applicant notes that whereas the Examiner indicates these components as part of FIG. 1 in Yokomizo, they are actually part of FIG. 4 in Yokomizo.) Indeed, the *operating system* never actually handles the interrupts in Yokomizo. Rather, the *interrupt handlers* handle the interrupts. For instance, for Yokomizo's "type I" interrupts, FIG. 6 shows in step S2 that processing is transferred from the OS to the corresponding interrupt handler, and then processing is returned to that prior to the interrupt in step S3 – i.e., back to the OS. Similarly, for Yokomizo's "type II" interrupts, FIG. 7 shows in step S6 that processing is transferred from the OS to the interrupt handler, and then is returned back to the OS in step S7.

Therefore, Yokomizo is not applicable in the first instance to the types of interruption-handling systems to which the claimed invention is generally limited, those in which the interrupt handler merely tells the operating system about an interrupt, and then the operating system actually handles the interrupt. As noted in the background section of the patent application as filed, "[i]nterrupts can be handled within the processor itself, by system firmware, or by an operating system executed by the processor." (P. 2, para. 9) Yokomizo, unlike the claimed invention, does not have its operating system handle the interrupts.

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Therefore, Yokomizo also inherently does not have its interruption handlers *store a recommendation as to how the operating system is to handle the interruption*, as to which the claimed invention is essentially limited. Because the interruption handlers actually handle the interrupts in Yokomizo, they do not need to pass on any type of recommendation to the operating system as to how the operating system should handle an interruption, since the operating system does not handle the interrupt. Furthermore, Applicant has reviewed the discussion of the interrupt handler 4, the operating system 6, and the storage 9 of Yokomizo in depth, and cannot find any indication that the interrupt handler 4 stores a recommendation in the storage 9 as to how the operating system 6 is to handle an interrupt.

This is why Applicant says that the Examiner may not have considered all the limitations of claims 1 and 7 in rejecting them over Yokomizo. Although Yokomizo, like the claimed invention, includes an interruption handler, an operating system, and a storage, it does *not* have the interruption handler storing a recommendation for the operating system to handle the interrupt. But claims 1 and 7 are functionally limited to the interruption handler storing a recommendation for the operating system to handle the interrupt. Therefore, Yokomizo cannot anticipate these claims.

Applicant notes that these limitations are those that provide the claimed invention with its advantages. For instance, in the background section of the patent application as filed, it is noted that "operating system responsibility for handling machine check aborts [viz., a type of interruption] can be problematic." (P. 2, para. 11) This is because "[e]ach operating system . . . must have the necessary intelligence to interpret the machine check aborts in the context of the system hardware implementation, and determine an appropriate course of action as to remedying the problem." (Id.) Most significantly, "[t]he processor architecture itself typically only passes the abort to the operating system, usually *without providing any further information regarding the machine check*." (Id.) By comparison, in at least some embodiments of the claimed invention, "[r]ecommendations for handling interruptions are formulated by the interruption

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handler, and passed to the operating system for servicing the interruptions.” (P. 13, para. 52)
The operating system itself, therefore, may “not have to have the knowledge as to how best to service the interruptions, but can instead rely on the recommendations provided by the interruption handler.” (P. 14, para. 52)

To summarize and conclude, Yokomizo does not anticipate claims 1 and 7 for the following two reasons. First, the operating system of Yokomizo does not have the operating system handle interrupts; rather, processing of interrupts is handled by the interruption handlers themselves. Second, as a result, the operating system of Yokomizo does not receive any recommendations from the interruption handler as to how to handle the interrupts, since indeed it does not need any because the operating system never handles the interrupts anyway. The first reason shows that Yokomizo is not in the same problem area as the claimed invention (and as to which claims 1 and 7 are generally limited), and the second reason shows that Yokomizo does not solve the problem as the claimed invention does (as to which claims 1 and 7 are specifically limited).

Claims 1, 4-7, and 10-11 as to Thielen

Claims 1, 4-7, and 10-11 have been rejected under 35 USC 102(e) as being anticipated by Thielen (6,008,108). Claims 1 and 7 are independent claims, from which claims 4-6 and 11 ultimately depend. As has already been noted, Applicant has amended claims 1 and 7 to better clarify their subjection inventions. Applicant asserts that Thielen does not anticipate claims 1 and 7, and therefore does not anticipate claims 4-6 and 10-11 for at least the same reasons.

Applicant believes that the Examiner also may not have considered all the limitations of claims 1 and 7 in rejection these claims over Thielen. As has been noted, the claimed invention is directed to an interruption handler that stores a recommendation for the operating system to handle an interruption in a storage, and that then calls the operating system for it to handle the interruption. The handler can finally examine the storage to determine if the operating system

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handled the interruption according to the recommendation. Applicant submits that Thielen does not anticipate at least these aspects and limitations of the claimed invention.

In particular, the interruption handler 510 does not store *a recommendation for the operating system 220 to handle the interruption*, within the storage 150, all of which are depicted in FIG. 5. As with Yokomizo, the operating system in Thielen never actually handles the interrupts, but rather the interrupt handler process them. For instance, "when [an] interrupt is received from the communications interface, . . . the interrupt handler is immediately executed as follows." (Col. 4, ll. 21-24) "The accessed interrupt handler routine includes multiple communication protocols that perform functions which include obtaining the data from the communications that places the data into the communications port." (Col. 4, ll. 28-32) That is, the *interrupt handler* – and *not* the operating system – handles or processes the interrupts.

Therefore, like Yokomizo, Thielen is not applicable in the first instance to interruption-handling systems to which the claimed invention is generally limited, those in which the interrupt handler merely tells the operating system about an interrupt, and then the operating system actually processes the interrupt. Thielen's interruption-handling system instead does the following. When an interrupt occurs, the operating system is called to save application instructions to be executed, and arranges so that alternative instructions are executed instead. (Col. 4, ll. 9-13) "These alternative instructions . . . may include operating system instructions for performing operating systems routines" (Col. 4, ll. 13-16) Then, the *interrupt handler* immediately is executed to process or handle the interrupt. (Col. 4, ll. 21-35) "Upon *completion of the interrupt handler routine*, the previously executing alternative instructions are retrieved and executed. Thereafter, . . . the remaining application instructions are retrieved and executed." (Col. 4, ll. 36-41)

That is, in Thielen, when an interrupt occurs, the operating system is told about the interrupt only so that it can save application instructions to be executed, and instead arrange alternative instructions to be executed. The interrupt handler then does its business, processing

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the interrupt. Once the interrupt handler routine is finished, the remaining application instructions can then be retrieved and executed by the operating system. The operating system in Thielen never actually processes or handles the interrupt itself, rather the interrupt handler does. Thielen, unlike the claimed invention, thus does not have its operating system handle interrupts.

Therefore, also like Yokomizo, Thielen inherently does not have its interrupt handler *store a recommendation as to how the operating system is to handle the interruption*, as to which the claimed invention is essentially limited. Because the interruption handler actually handles the interrupts in Thielen, it does not need to pass on any type of recommendation to the operating system as to how the operating system should handle an interruption, since the operating system does not have to handle the interruption. Applicant has thoroughly reviewed the discussion of the interruption handler 510, the operating system 220, and the storage 150 of Thielen, and cannot find any indication that the interruption handler 510 stores a recommendation in the storage 150 as to how the operating system 220 is to handle an interrupt.

As with Yokomizo, then, this is why Applicant says that the Examiner may not have considered all the limitations of claims 1 and 7 in rejection them over Thielen. Although Thielen includes an interruption handler, an operating system, and a storage like the claimed invention does, Thielen does not have the interruption handler storing a recommendation for the operating system to handle the interrupt. Since claims 1 and 7 are functionally limited to such an interruption handler storing such a recommendation for the operating system to handle the interrupt in accordance therewith, Thielen cannot anticipate therefore anticipate these claims.

To summarize and conclude, Thielen, like Yokomizo, does not anticipate claims 1 and 7 for the following two reasons. First, the operating system of Thielen does not have the operating system handle interrupts, but rather has the interruption handlers themselves handle the interrupts. Second, as a result, the operating system of Thielen does not receive any recommendations from the interruption handler as to how to handle the interrupts, since indeed it does not need any because the operating system never handles interrupts anyway.

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Rejections under 35 USC 103

Claims 2-3, 8-9, and 12-20 have been rejected under 35 USC 103(a) as being unpatentable over Thielen in view of Marisetty (6,675,324). Claims 2-3, 8-9, and 12-14 are dependent claims depending from independent claim 1 or independent claim 7. Therefore, claims 2-3, 8-9, and 12-14 are patentable for at least the same reasons that claims 1 and 7 are patentable.

Claim 15 is an independent claim, from which claims 16-20 ultimately depend. Claim 15 has been amended to better clarify its subject invention. Claim 15 has been rejected essentially by relying upon Thielen to disclose the limitations of claim 15 that are comparable to those of claim 7, and by relying upon Marisetty to disclose an article of manufacture including a computer-readable medium. However, Thielen does not disclose the limitations of claim 15 that are comparable to those of claim 7, for reasons that have been discussed above in relation to claim 7. For instance, as has been discussed in relation to claim 7, Thielen does not disclose storing a recommendation for the operating system to handle a processor interruption, calling the operating system to handle the interrupt, and determining whether the operating system handled the interrupt according to the recommendation. Therefore, Thielen in view of Marisetty does not render claim 15 obvious. For at least the same reasons, Thielen in view of Marisetty does not render claims 16-20 obvious, since claims 16-20 ultimately depend from claim 15.

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Conclusion

Applicants have made a diligent effort to place the pending claims in condition for allowance, and request that they so be allowed. However, should there remain unresolved issues that require adverse action, it is respectfully requested that the Examiner telephone Applicants' Attorney so that such issues may be resolved as expeditiously as possible. For these reasons, this application is now considered to be in condition for allowance and such action is earnestly solicited.

Respectfully Submitted,



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Date

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